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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,084	03/03/2004	Shih-Ming Chang	TSM02-0658	4892
43859 7590 01/03/2007 SLATER & MATSIL, L.L.P. 17950 PRESTON ROAD, SUITE 1000 DALLAS, TX 75252			EXAMINER ROSASCO, STEPHEN D	
			ART UNIT	PAPER NUMBER
			1756	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/03/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/792,084

Applicant(s)

CHANG ET AL.

Examiner

Stephen Rosasco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>3/3/04</u> | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Applicant's election without traverse of Group II (claims 15-30) in the reply filed on 11/13/06 is acknowledged.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 24-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Knoedl, Jr. (5,705,298).

Knoedl, Jr. teach that a mask can be accurately produced first by computer generation of a holograph, containing information about a three-dimensional lithographic pattern, at the planar side of a transparent conforming mask blank. With photoresist coated onto either the contoured side of the mask or on the part itself, by proper illumination of the holograph, a three-dimensional hologram including an image of the desired pattern is produced and is exposed into the photoresist at the contoured surface of the three-dimensional mask or on the part itself.

opaque portions form the holographic transformation of a pattern which is to be imaged onto the three-dimensional side of the mask or onto the part to be masked itself. a positive photosensitive resist material is placed on the three-dimensional side of the mask or on the three-dimensional part to be masked. Light is irradiated through the holograph to produce a three-dimensional hologram including an image of the desired pattern that is

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used to expose the photosensitive resist material The photosensitive resist material is then developed to remove the areas that were exposed.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi (2003/0124437) in view of Goto et al. (5,504,596).

The claimed invention is directed to a method of patterning a target, comprising providing a target, the target having a top surface, the target top surface having a material layer disposed thereon, a first photoresist layer disposed over the material layer, a transparent spacer material disposed over the first photoresist layer, and a second photoresist layer disposed over the spacer material; and patterning the second photoresist layer of the target with a holographic fringe representation of an image.

And further comprising using the second photoresist layer to pattern the first photoresist layer with the image.

And further comprising providing a lithography reticle, the reticle comprising a pattern of transparent regions and opaque regions, the pattern comprising the holographic fringe representation of an image to be patterned on the material layer of the target; and using the lithography reticle to pattern the second photoresist layer of the target with the holographic fringe representation of the image.

The applicant discusses the limitations of the prior art in that reticle defect inspection and repair are difficult, time-consuming tasks if possible. In the claimed invention a layout pattern or image to be transferred to a target is converted into a holographic representation of the image, and a hologram reticle is manufactured that includes the holographic representation. The hologram reticle is then used to pattern a wafer.

Advantageously, imperfections or defects on the hologram reticle are not transferred to the wafer. The original image is partitioned and encoded across the entire hologram reticle, which breaks the one-to-one corresponding relationship between defects on the reticle to the wafer. A defect on the hologram reticle does not directly induce a flaw on a wafer, but rather, the defect influence is spread into the entire hologram reticle image, and merely affects the intensity or contrast of the hologram reticle slightly.

The lithography reticle includes a material having a pattern, the pattern including opaque regions and transparent regions, the pattern comprising a holographic representation of an image, wherein the holographic representation of the image is formed using a Computer-Generated Holography encoding technique.

Claims 15-24 -

Taniguchi teaches (see claim 10) a method of recording using a hologram mask, comprising a preliminary exposure step for producing a hologram mask having an interference fringe containing modulation information on a light transmittance and a phase by using a plurality of original mask to expose on the same hologram material a light transmitting-screening pattern of an optical modulation layer formed in each original mask, and a regular exposure step to record modulation information on said light transmittance

and phase on an exposed object by irradiation on said hologram mask, wherein said preliminary exposure step includes: a preparation step to prepare at least a first original mask and a second original mask; a first secondary exposure step to expose said light transmitting-screening pattern of said first original mask on said hologram material by using a first object light to be irradiated on said hologram material through said first original mask and a first reference light to be irradiated on said hologram material not through said first original mask; and a second secondary exposure step to expose said light transmitting-screening pattern of said second original mask on said hologram material by using a second object light to be irradiated on said hologram material through said second original mask and a second reference light to be irradiated on said hologram material not through said second original mask, and by changing a second phase difference between said second object light and said second reference light in a position in an optical path from a light source to said hologram material so that a first phase difference between said first object light and said first reference light may differ from the second phase difference.

Taniguchi also teaches in claim 8 that the hologram material has different photosensitive films or photosensitive layers to be used respectively in said first step and said second step for exposure formed thereon.

The teachings of Taniguchi differ from those of the applicant in that the applicant teaches the use of a two successive layers of photoresist on a substrate.

Goto et al. teach (see claims) an exposure apparatus for reproducing a pattern of a mask onto a photosensitive surface of a substrate using a holographic technique using more than one layer of resist.

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It would have been obvious to one having ordinary skill in the art to take the teachings of Taniguchi and combine them with the teachings of Goto et al. in order to make the claimed invention because it is well known in the art to use multiple layers when using holographic exposure due to the need for combining images on a substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'S. Rosasco', with a stylized, sweeping flourish extending from the end of the name.

S. Rosasco
Primary Examiner
Art Unit 1756

S. Rosasco
12/26/06